

FCA US LLC Chronology  
Power Inverter Module  
Submitted on May 10, 2016

- On June 19, 2014, the first Power Inverter Module (PIM) replacement repair order was documented.
- Two previous field actions, 14V-235 (P23) and 15V-179 (R15) were conducted to address two other PIM-related failure modes in the Fiat 500e (“FF”) vehicles that can lead to a loss of propulsion.
- Between May 21, 2015 (when R15 launched) and March 23, 2016 continued evaluation of returned PIMs led to the discovery of a third failure mode, voltage transients on the PIM ground line, which can lead to false DTC(s) that will suspend propulsion.
- In March, 2016, the FCA US LLC (“FCA US”) Powertrain Electrification Team completed work to identify the voltage transient root cause and finalized a new diagnostic strategy to better monitor the ground voltage and ignore transients that are not true over-voltage conditions.
- On March 23, 2016, a proposed RRT was brought forward to make dealers aware of the condition and to deploy revised diagnostic software.
- On March 23, 2016, the FCA US Vehicle Safety and Regulatory Compliance organization opened an investigation based on review of the proposed RRT from the FCA US Powertrain Electrification Team to assess potential consequences of the condition.
- Root cause is voltage transients on the PIM ground line sensed and falsely diagnosed by the PIM software as over-voltage conditions. The misinterpretation of transient voltage by the PIM can set DTC(s) PA1EE and/or POA1B.
- Investigation determined that the consequence of setting DTC(s) PA1EE and/or POA1B is loss of motive power, or propulsion system shutdown.
- The suspect population was established as April, 2012CY, start of production for the 2013 MY and January, 2016CY, end of production for the 2016MY. The PIM and software is unique to the 2013-2016 MY FF vehicles.
- The 2017 MY FF vehicles will be produced with updated software to correct for this issue.
- As of April 29, 2016, FCA US identified approximately 144 CAIRs, 247 field reports and 17 VOQs for loss of motive power potentially related to this issue.
- As of April 29, 2016, total warranty is 247 at 15c/1000. The warranty includes PIM replacements from all causes, some of which are potentially related to this issue. This is roughly a 1.5% PIM replacement rate for all causes, across all model years with up to three years of exposure in the field. The supplier has diagnosed 38 PIM’s in which the P1AEE and/or POA1B codes were set and assumed to have shut down propulsion.
- As of April 29, 2016, FCA US is unaware of any accidents or injuries potentially related to this issue.
- On May 3, 2016, FCA US determined, through the Vehicle Regulations Committee, to conduct a voluntary safety recall of the affected vehicles.